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Notes on the Vertebrate fauna of Katandra Bushland Sanctuary, Sydney, Australia

by
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Abstract: Katandra Bushland Sanctuary is an area designated for the conservation of its indigenous flora and fauna typical of Hawkesbury Sandstone country. During a two-year period (March 1998–April 2000) a study was carried out in order to survey the fauna of the Sanctuary. Notes regarding history and function, the environment, the flora and the faunal survey are given here. This project is considered as a continuation of the Australian faunal studies conducted by the authors in 1997.
Keywords: vertebrate fauna-inventory, Katandra, NSW, Australia

History and function

The Sanctuary is a Crown Reserve administered by the Department of Land and Water Conservation, managed and supported by the Friends of Katandra Bushland Sanctuary Inc., by providing financial contribution, welcoming visitors on open days and assisting with weeding and general maintenance. The Sanctuary was established following a gift of land to the people of New South Wales by the late Mr. Harold Seymour, a highly respected local businessman, and dedicated on the 27th of October 1967 to the promotion of the study and preservation of the native flora and fauna of the Hawkesbury Sandstone country. It is also an important educational resource for students and the general public.

Geology and environment, site characterization

The 11.5 hectares of land, known as Katandra Bushland Sanctuary, is part of a large, albeit partially subdivided heath– and woodland stretching from Warriwood to Ku-ring-gai Chase National Park. The Sanctuary covers a section of the rocky escarpment, which dominates the landscape in this area, and thus the terrain differs in levels. The highest section is found along its western side, where a plateau and the escarpment create a natural boundary. Most of Katandra lies below this escarpment, mainly on the hillside facing East. The eastern boundary is the lowest part of the Sanctuary. The visible, major rock unit is Triassic Hawkesbury Sandstone. It is massive, highly cross-bedded, quartz sandstone containing occasional pebbly layers and relatively minor shale lenses. Many cliff sections and boulders show cross-bedding in varying thickness, from a few centimeters to over a meter. General weathering is evident on bare rock and where poorly cemented layers of sandstone and thin shale lenses have eroded at a faster rate than the more resistant sections of the rock, where overhanging cliffs and shallow caves have been formed. Some joint blocks of sandstone have fallen from the higher regions of the escarpment and now they are located as large, individual boulders below the cliffs. Weathering, washout and scour produced a variable sandy soil in most parts of the Sanctuary.

Dark gray, loose loamy sand with single-grained structure seems to be the most characteristic topsoil (35cm to 60 cm deep) with occasional slight gradation to pale yellow loamy sand with sandstone fragments (Roberts 1999). The Sanctuary corresponds with the Lambert soil landscape model (Chapman & Murphy 1989). The soil is poorly aggregated, therefore it is erodible where plant cover is not adequate. However, vegetation cover is dense at most parts of the Sanctuary. In many sections a rich, compost-like soil has developed from leaf- litter and other decomposed vegetable matter.

There are several small watercourses across the Sanctuary, but most of these dry out during extended periods of dry weather. Only Katandra Creek seems to be a permanent creek, however at the times of very poor rainfall it is reduced into a string of almost still, shallow rockpools.

The climate of Katandra is typically N. S. W. coastal. The area is too small to have any climatic characteristics different from the surrounding north-eastern districts of Sydney. However, microclimatic conditions are varied: on the western plateau and on the top of the escarpment the environment is drier and cooler than in the lower lying sections of the Sanctuary, mainly due to wind and frequent exposure to sunlight. The hillside below the escarpment and the lowest, eastern part of the Sanctuary is warmer and more humid, especially through the warmer months (November–February). Humidity is highest along the lowest section of the watercourses.

The Sanctuary is surrounded by a chainwire fence, which was originally designed to keep out *Vulpes vulpes* and *Canis familiaris*. This method does not seem to be adequate as feral animals frequent the Sanctuary and at present some (e.g. *Vulpes vulpes, Felis catus* and *Oryctolagus cuniculus*) may even breed within its boundaries. The fence does not seem to restrict the movements of native mammals, as *Wallabia bicolor*, *Parameles nasuta*, *Rattus* spp. and perhaps *Tachyglossus aculeatus* as individual animals can find or make suitable gaps under it to exit and enter the Sanctuary. The fence does not restrict the movements of arboreal species, bats and birds, reptiles and amphibians.

The area is open to the public once a month from March to June, every Sunday from July to October and closed during the warmest months (November–February). Human interference with wildlife within the Sanctuary is minimal. Regular activities consist of track maintenance, weeding and walking (single individuals or small groups) on marked trails.

Flora

Approximately 350 native plant species have been identified in Katandra: 33 fern, 1 cycad, 1 conifer, 99 monocot (including 24 orchids) and 216 dicotyledon species (Brooker & Kleinig 1983, Fairley & Moore 1989, Coveny 1997). These plants form five main types of vegetation communities here: above the escarpment is woodland with *Corymbia gummifera, Angophora costata, Xanthorrea arborea, Acacia oxycedrus, Ricinocarpos pinifolius, Dodonela triquetra, Pimelea linifolia* and wet heathland with *Banksia ericifolia, Viminaria juncea, Acacia suaveolens, Callicoma serratifolia* and *Gahnia sieberiana* as the most prominent plants.

On the hillside below, the drier areas are covered by open forest with *Eucalyptus umbra, E. piperita, Angophora costata* and *Corymbia gummifera*. In sheltered areas of the hillside there are moist, tall open forest stands with *Syncarpia glomulifera, Allocasuarina torulosa, Eucalyptus scias, Livistona australis* as the most dominant trees. The most evident shrubs are *Prostanthera denticulata, Bertya brownii, Boronia thujona, B. mollis, Ceratopetalum*

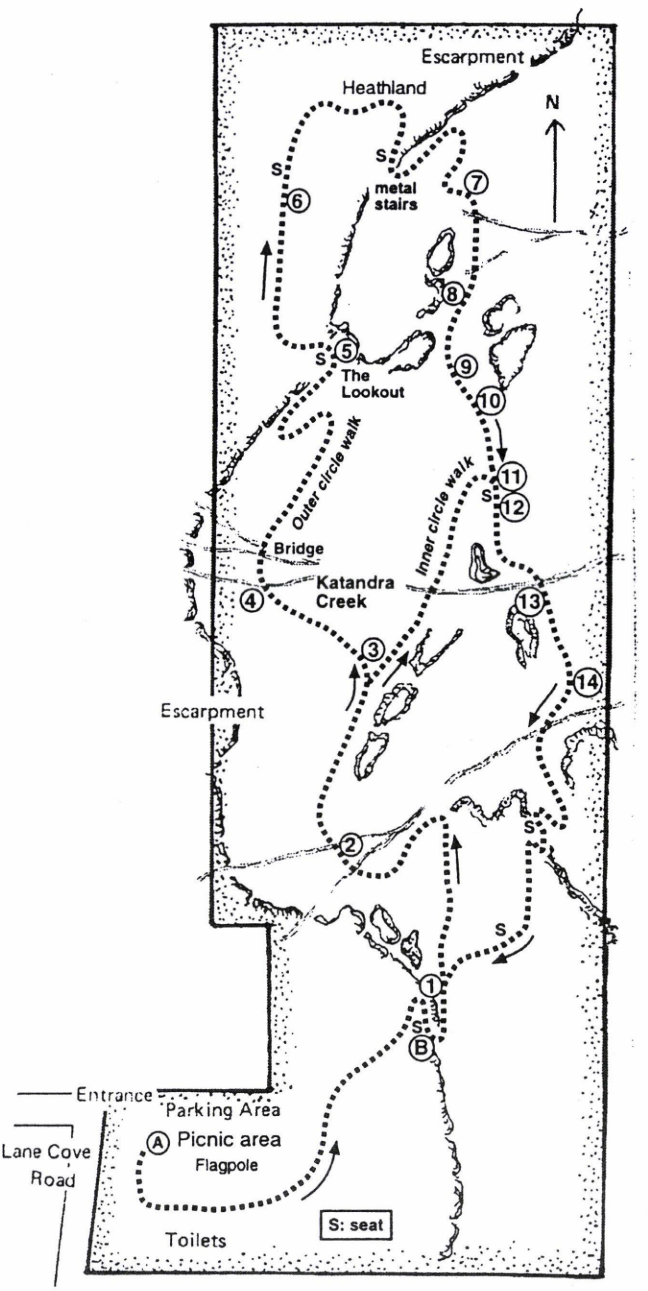

Fig. 1. The map of Katandra Bushland Sanctuary

gummiferum, Logania barbara and *Pultenaea flexilis.* Along the lower sections of the watercourses rainforest-like closed forests are present with *Livistona australis, Ceratopetalum apetalum, Tristaniopsis laurina, Todea barbara* and *Cissus hypoglauca* (McDougal 2000). A number of plant species in the Sanctuary are rare and/or uncommon (Benson & Howell 1994, Sherringham & Sanders 1993). A large number of species are used directly by mammals and birds either as food source or for nesting and sheltering and some other species are used indirectly (e. g. some flowering plants attract insects which in turn feed insectivorous birds and mammals). A more detailed study of the connection between plants and animals inhabiting the Sanctuary would be needed.

There are very few non-indigenous plants in Katandra. An active weeding program by the Friends of Katandra Bushland Sanctuary Inc. is focused on the eradication of all introduced plants within the Sanctuary.

Several bushfires were recorded in Katandra, the most recent one occurred in January 1994. On that occasion parts of the Sanctuary were severely damaged while other sections suffered less. It seems that at present the vegetation has recovered and the flora is generally healthy and diverse.

Methods

Larger mammals were surveyed by visual observation during daylight hours. The mammals were identified and designated into families using the keys given by Strahan (1987, 1998). The early hours, just around sunrise and late afternoon yielded the best results. *Wallabia bicolor* was observed often in these times, usually in thick scrub, at sites No. 1 and No. 18. On overcast days more animals were seen than on clear days. Mammals were also observed at night by torchlight. Mostly arboreal species were seen by this method, such as *Trichosurus vulpecula* and *Pseudocheirus peregrinus.* On moonless or overcast nights more animals were seen than on clear, moon-lit nights.

Small mammals such as *Rattus* spp. and *Antechinus* spp. were trapped using Elliot traps, baited with a compound bait of peanut butter, honey and rolled oats (Hangay & Digley 1987). The traps were laid at around 8 p.m. and inspected before sunrise in order to determine and free the animals before the ambient temperature could rise. As a result of this precaution, not even a single captured animal has died. Traps were laid during a one-month period in various locations along the walking trails and their positions were changed every three days. During the trapping program (January 2–31, 1999) 20 traps were laid on 28 occasions, totaling approximately to 5600 trap-hours.

The presence of mammals was also surveyed by searching for their signs, droppings and footprints. The characteristic scratchings of *Parameles nasuta* were observed, *Wallabia bicolor* droppings collected and footprints recorded. Most footprints were collected by sand traps, set up in the following manner: an area of approximately one square meter was cleared of vegetation and clean river sand was spread over it. The sand was smoothed with a trowel and a ball of compound bait was placed in its center-point. As the animals approached the bait, they left their footprints in the sand. *Parameles nasuta, Rattus* spp., *Trichosurus vulpecula* and *Vulpes vulpes* prints were mainly collected by this method. Some footprints were collected under overhanging cliffs where the accumulated sand was free of leaf-litter and from muddy tracks where the animals left clear impressions. Mainly *Tachyglossus aculeatus, Wallabia bicolor* and feral *Canis familiaris, Felis catus, Vulpes vulpes* and *Oryctolagus cuniculus* prints were collected this way. The best (clearest) prints were cast in plaster and kept as reference and interpretive material.

Birds were surveyed mostly by visual observation, occasionally by their sound. Bird capturing of any sort was not employed and consequently a number of birds — mostly small, juvenile/ immature forms of passerines — where sighted but could not be identified. These are not included in the species list below. Species that were not identified with certainty are marked with a (?) mark. Birds that were seen flying over the Sanctuary and were possible to be identified were recorded. The majority of the

bird survey was carried out during the daylight hours, although on some occasions birds were observed by torchlight at nights. The identification and nomenclature of birds follows Pizzey (1980).

Notes on confirmed breeding/nesting were based on actual sightings of occupied nests or on nests in the progress of construction. The possibility of breeding by a species in the Sanctuary was also assessed by observed behavior of the birds (e. g. courtship displays, consistent food carrying, frequent presence of juveniles) and/or the evident compatibility of habitat and local populations of the species.

Reptiles and amphibians were surveyed by observation only, on a few occasions by searching under logs and rocks and in leaflitter. Some frog calls were recorded at nights, while occasionally frogs were located at night by torchlight. Taking the relative paucity of Katandra's reptile and amphibian fauna and the evident vulnerability of the resident populations no live specimen was captured for closer examination. Those specimens that could not be approached close or only detected by their call, or could not be positively determined for some other reason are not included in this survey. Some of the conventional reptile-collecting methods are often detrimental to vegetation (e. g. removing sections of bark from living trees), therefore such techniques were not employed in the Sanctuary. Reptiles and amphibians were identified using keys and descriptions given by Cogger (1998). A thorough survey of the entire reptile and amphibian fauna was not achieved during this project. Undoubtedly there are more species of these animals in the area and a more detailed research would be needed in the future.

Approximately 256 hours were spent in the field while observing vertebrate animals in Katandra. This paper dealing with the results of the Katandra project is considered as a continuation of the Australian faunal studies conducted by the authors in 1998 (Bankovics *et al.* 1998).

Results

Mammals

There were 19 mammal species, including the feral ones, identified in the studied area. They belong to 15 families. Small insectivorous bats were noted, but not identified.

Native mammals:

Tachyglossidae

Tachyglossus aculeatus

Uncommon in the Sanctuary, one individual was recorded by its footprint under an overhanging rock-ledge, near site No. 2.

Dasyuridae

Antechinus stuartii

This species prefers the wet eucalypt forests along the coast of South-Eastern Australia. It is common near the picnic area, some were trapped within the building.

Dasyurops maculatus

Uncommon in the entire area, probably lives only in Katandra. Only one early morning sighting of a single adult is recorded by Hangay near site No. 2. Other unconfirmed sightings were reported, including the sighting of a small group of juveniles.

Paramelidae

Parameles nasuta

Common in the Sanctuary, although seldom seen. The scratchings and diggings of this animal are evident along the walking trails. More common on the lower sections of the Sanctuary.

Phalangeridae

Trichosurus vulpecula

Common mammal of the area, nesting in hollow trees (mostly *Eucalyptus* spp. and *Angophora* spp.) and in the roof cavities of buildings. Some individuals are used to human presence and are opportunistic feeders of rubbish and leftovers.

Pseudocheiridae

Pseudocheirus peregrinus

Common arboreal species, however, not as often seen as *Trichosurus vulpecula*.

Petauridae
Petaurus breviceps
Probably more common than the number of sightings (2) indicate. It was seen at night, on flowering *Angophora* sp.

Burramydae
Cercartetus nanus
Rarely seen in the Sanctuary. One individual was recorded on the flowers of *Banksia* sp., near site No. 4.

Acrobatidae
Acrobates pygmaeus
Only one individual was seen at night on flowering *Banksia* sp., near site No. 4.

Macropodidae
Wallabia bicolor
An estimated 8–10 animals live in the Sanctuary, possibly interacting with other individuals outside the fenced-in area. Most frequently seen near sites Nos 1, 14 and 6.

Chiroptera ordo
Many specimens of 2 or 3 species were observed on numerous occasions at dusk and at night. More research is needed in order to list the *Chiroptera* spp. of the Sanctuary.

Pteropodidae
Pteropus poliocephalus
Frequent visitor in the Sanctuary during the flowering of *Eucalyptus* spp. and *Angophora* spp. when it feeds on the blossoms of these trees. None was seen during daylight hours, therefore it is concluded that no permanent roost of these bats exists within Katandra.

Muridae
Rattus fuscipes
Common at most parts of the Sanctuary, less common on the lowest and wettest sections from site No. 7 to No. 12.
Rattus lutreolus
Uncommon in the Sanctuary, one individual was trapped near site No. 13.

Feral and introduced (not native) mammals:

Canidae
Canis familiaris
These are not true feral animals in Katandra as they do not breed in the wild. However a number of dogs from neighboring households occasionally visit the Sanctuary. Their presence is undesirable as they pose potential danger to wildlife.
Vulpes vulpes
The exact number of individuals in the Sanctuary is not known and no den was found. The presence of this species is evident, confirmed by recorded footprints and occasional strong, characteristic odour near sites Nos 2, 3 and 4.

Felidae
Felis catus
Feral cats live within the boundaries of the Sanctuary and it is obvious that they cause damage to native fauna by predation and by competition.

Leporidae
Oryctolagus cuniculus
A few individuals were noted near site No. 6. and it is assumed that the species breeds outside the boundaries as no warren was found.

Muridae
Rattus rattus
Only one individual was trapped near the picnic area, however it is assumed that the species is not uncommon in the area, especially near buildings. It probably competes with *Rattus fuscipes*.
Rattus norvegicus
Two juvenile specimens were trapped near site No. 1. Sand-trap footprints nearby indicated the presence of more individuals in the vicinity. The species poses a threat to native small mammals, birds, reptiles and possibly amphibians.

Birds

64 bird species were recorded, belonging to 35 families. The birds were identified using several handbooks and field-guides (Cayley 1966, Forshaw 1969, Slater 1970, Frith 1976).

Native birds:

Anatidae

Chenonetta jubata
Several sightings are recorded of this species, which is common in adjacent areas. Possibly breeds in the Sanctuary.
Anas superciliosa
Observed only in flight over the Sanctuary.

Accipitridae

Elanus notatus
This bird species was seen on several occasions, hovering over the heathland or perching on high tree-tops between sites Nos 4 and 6. Possibly breeds in the Sanctuary.
Haliastur sphenurus
Observed only in flight over the Sanctuary, on one occasion.
Accipiter fasciatus
One adult specimen was observed in flight, on one occasion.
Accipiter cirrocephalus
This species was observed on two occasions, once in flight over the Sanctuary and once perching in a *Eucalyptus* sp. near site No. 6.

Falconidae

Falco cenchroides
Observed on numerous occasions, usually in flight over the entire Sanctuary, more often over the western section. Possibly breeds in the Sanctuary.
Falco peregrinus
This species was observed on four occasions, flying over the Sanctuary from the south-west to north-east.
Falco berigora
Observed on one occasion, in flight over the Sanctuary.

Laridae

Larus novaehollandiae
Observed flying over the Sanctuary, in west-east direction, possibly from the nearby garbage tip in the west to the eastern seashore.

Columbidae

Columba leucomela
Observed on two occasions, possibly the same individual, near the picnic area.

Cacatuidae

Eolophus roseicapillus
Observed on a number of occasions, always in flight. This species is common in adjacent areas. Possibly breeds in the Sanctuary.
Cacatua galerita
Observed on numerous occasions as flocks of this bird frequently feed and roost in the Sanctuary. Most probably breeds within the boundaries, possibly in the tall forest north of Katandra Creek and between the Inner Circle Walk and the Outer Circle Walk.

Loriidae

Trichoglossus haematodus
Observed on four occasions only. Small groups of this bird feed on the flowers of *Eucalyptus* spp. and *Angophora* spp.

Polytelitidae

Alisterus scapularis
Observed on one occasion only, near the picnic area.

Platycercidae

Platycercus elegans
One pair of this species was observed on one occasion only near the toilet block.
Platycercus eximius
Seems to be more common during the colder months (from April to September) as it was mainly seen then in the Sanctuary on several occasions.

Cuculidae
Cuculus variolosus
Only seen during the warmer months (from November to February) and near sites Nos 11 and 12.
Cuculus pallidus
Observed on one occasion near site No. 6.
Chrysococcyx lucidus plagosus
Observed on one occasions near site No. 14.
Scythrops novaehollandiae
Observed on several occasions during the months of September 1998 to February 1999. Specimens of this otherwise uncommon species were relatively numerous in the entire area in this time as they possibly linked to an unusually large local *Strepera fuliginosa* population.
Centropus phasianinus
Uncommon bird of the area. It was observed on one occasion near site No. 13. Possibly breeds in the Sanctuary.

Strigidae
Ninox strenua
Observed at night by the senior author on one occasion. Another confirmed sighting is recorded. This species is probably more common than the sightings indicate. Possibly breeds within the Sanctuary.
Ninox novaseelandiae
This common owl has been recorded on two occasions within the Sanctuary, near sites Nos 3 and 9. Its call was noted on several occasions. Most probably it breeds in the Sanctuary.

Podargidae
Podargus strigoides
Observed on three occasions at night. This bird is most probably more common in the Sanctuary than the sightings indicate. Most probably breeds in the Sanctuary.

Alcedinidae
Dacelo novaehollandiae
Frequently observed and heard in the Sanctuary. It breeds within the boundaries.
Halcyon sancta
Frequently observed, it breeds in the Sanctuary.

Coraciidae
Eurystomus orientalis
Observed during the warmer months (from September to February). It possibly breeds in the Sanctuary, but it is uncommon.

Menuridae
Menura novaehollandiae
Observed on numerous occasions, however it may be represented in the Sanctuary by only one breeding pair. It is highly vulnerable due to predation by feral predators and possibly by *Dasyrus maculatus* and egg predation by *Corvus coronoides*.

Hirundinidae
Hirundo neoxena
Observed on numerous occasions in flight and perching on overhead cables or on exposed tree branches.

Campephagidae
Coracina novaehollandiae
Observed on a number of occasions, this species seems to be uncommon in the entire area. It breeds near site No. 17.

Rhipiduridae
Rhipidura fuliginosa
Often seen at many locations in the Sanctuary, it breeds within its boundaries.

Rhipidura leucophrys
Uncommon in the Sanctuary, seen only a few occasions near the front entrance.

Monarchidae
Monarcha melanopsis
Observed in the warmer months (October–February) only. Breeds in the Sanctuary, near site No. 12. and 13.

Petroicidae

Microeca fascinans (=Microeca leucophae)
Observed in small groups, possibly nomadic, on western plateau.
Eopsaltria australis
Observed on a number of occasions, usually in dense vegetation, along the Inner Circle Walk. Most probably breeds in the Sanctuary.

Pachycephalidae

Pachycephala pectoralis
Observed on a few occasions, more often on the Inner Circle Walk at the Katandra Creek crossing, where it was nesting.
Colluricincla harmonica
Observed on a number of occasions, usually in closed forest, near the lower section of Katandra Creek. Most probably breeds in the Sanctuary.

Cinclosomatidae

Psophodes olivaceus
Rarely seen, but more often heard at the wet heathland on the western plateau and in the closed forest along Katandra Creek. Most probably breeds in the Sanctuary.

Maluridae

Malurus cyaneus
Observed only on one occasion at the picnic ground. Most probably an incidentally vagrant individual.

Acanthizidae

Sericornis frontalis
Observed on many occasions throughout the Sanctuary. The birds frequent areas with dense ground cover, where they also breed.
Acanthiza pusilla
Observed on many occasions, this species is one of the commonest birds in the Sanctuary. It nests close to the ground in dense undergrowth.
Acanthiza nana
Observed near the picnic ground, sometimes probably in mixed groups with other species [e. g. immature forms of *A. pusilla* (?) and *Smicornis brevirostris* (?)]. Not as common in the Sanctuary as *A. pusilla*. It breeds within the boundaries.
Smicrornis brevirostris
Observed all year around, as groups of this species seem to permanently occupy relatively small areas, usually in sections of the forest where *Eucalyptus* spp. are the dominant trees. They breed in the Sanctuary.

Climacteridae

Climacteris leucophaea
Observed in a variety of habitats, more commonly in the closed forest along Katandra Creek. It breeds in the Sanctuary.

Meliphagidae

Anthochaera carunculata
Observed in a flock of eight birds on one occasion, in June 1998.
Anthochaera chrysoptera
Observed on a few occasions, in small (4–8 individuals) flocks, feeding on *Banksia* flowers during the colder months.
Manorina melanocephala
Occasional visitor, mainly seen at the picnic area. Not as common as elsewhere in adjacent areas.
Phylidonyris novaehollandiae
Uncommon in the Sanctuary, observed feeding on *Eucalyptus* sp. flowers, on the western plateau.
Phylidonyris nigra
Uncommon in the Sanctuary, observed in the heathland at western boundary.
Melithreptus lunatus
Observed on a few occasions only, at the edge of tall open forest, near site No. 7.
Lichenostomus chrysops
Observed on a number of occasions from August 1998 to February 1999. Most likely breeds in the Sanctuary.

Pardalotidae

Pardalotus punctatus
Occasional visitor only, observed on two occasions, near picnic area.

Zosteropidae
Zosterops lateralis
Observed on a few occasions only, near entrance. Possibly breeds in adjacent areas.

Estrildidae
Emblema temporalis
Only one individual was observed on one occasion, possibly a vagrant or aviary escapee.

Dicruridae
Dicrurus hottentottus
Observed repeatedly (perhaps the same individual) over a short period of time in July 1998.

Grallinidae
Grallina cyanoleuca
Occasional visitor seen near the entrance and picnic area. Much less common in the Sanctuary than elswhere in the vicinity.

Cracticidae
Cracticus torquatus
Have been seen and heard on many occasions in the Sanctuary. Probably breeds within the boundaries.
Gymnorhina tibicen
Observed regularly in the Sanctuary.
Strepera graculina
Observed regularly in the Sanctuary, sometimes in flocks.

Corvidae
Corvus coronoides
Observed regularly , however it is likely, that only one breeding pair lives in the Sanctuary.

Introduced bird species:

Sturnidae
Acridotheres tristis
Rarely seen in the Sanctuary, usually attracted by food scraps at the picnic area.

Passeridae
Passer domesticus
Rare visitor in the Sanctuary, observed near the entrance and car park area.

Reptiles

16 species of reptiles, belonging to 8 families were recorded.

Chelidae

Chelodina longicollis
Observed on one occasion by members of Friends of Katandra Bushland Sanctuary.

Gekkonidae
Phyllurus platurus
Observed on two occasions, once near picnic ground, once under rock ledge of the escarpment, near to the eastern boundary.

Pygopodidae
Lialis burtonis
Found in leaf-litter in several locations in the Sanctuary.

Agamidae
Amphibolorus barbatus
Observed near the entrance.
Amphibolorus muricatus
At least two individuals were observed near site No. 6.
Physignathus leuseurii
No live specimens were seen but one dead, fully matured large male was found near the Katandra Creek crossing, on Inner Circle Walk.

Varanidae
Varanus rosenbergi
Two individuals were seen in Katandra, one near site No. 2. and another near site No. 6. One road-killed specimen was found nearby, however, outside the boundaries.
Varanus varius
Several individuals live in the Sanctuary.

Scincidae
Ctenotus robustus
Frequently seen on the sandstone formations of the escarpment and in the heathland near the north-eastern boundary.
Ctenotus taeniolatus
Observed on flaking sandstone rocks of the escarpment.

Egernia whitii
Frequently seen in woodland and heath.
Sphenomorphus quoyii
Frequently observed along the walking tracks, especially between sites Nos 2. and 3. and near Katandra Creek.
Tiliqua scincoides
Observed near picnic area.

Boidae
Morelia spilota
Observed on one occasion by a member of the public.

Elapidae
Cacophis squamulosus
One individual was seen under a log near site No. 3.
Pseudechis porphyriacus
One individual was observed near site No. 13.

Amphibians

4 species of amphibians, belonging to 2 families were recorded.

Myobatrachidae
Limnodynastes tasmaniensis
Observed several times under large, fallen timber in wet heathland at the eastern part of the Sanctuary.
Ranidella signifera
Observed several times under wet grass– and leaf-litter near site No. 5.

Hylidae
Litoria freycineti
Observed only once (October 1998) near toilet block.
Litoria lesueuri
Observed on several occasion near toilet block.

The most important frog-call recorded from Katandra is that of *Heleioporus australiacus*. While the call is rather characteristic, the existence of this species within the boundaries of the Sanctuary needs confirmation. *H. australiacus* was recorded at the nearby escarpment area, outside the boundaries of Katandra.

Discussion

The Katandra Bushland Sanctuary is especially important from conservation point of view as it harbors a high number of native flora and fauna elements within the metropolitan limits of Sydney. From its vegetation communities the wet heathland and the relatively small closed- forest are perhaps the most vulnerable and therefore most valuable. However, the rest of the area is also very important as a number of unique plant species live there also. Most notable of these are: *Bertya brownii, Boronia thujona, Prostanthera denticulata, Cryptocarya glauscencens, Cryptocarya microneura* and *Eucalyptus scias*. The diverse mosaic-like botanical composition of the Katandra leads to the occurrence of a rich fauna.

The following mammal species are either rare or uncommon and/or especially sensitive in the Sydney region, but do occur within the limits of the Sanctuary and hence their protection and management deserve further conservation effort: *Tachyglossus aculeatus,*

Dasyurops maculatus, Cercartetus nanus, Acrobates pygmaeus, Rattus lutreolus. Among the birds of similar status, from conservation point of view the following are the most important: *Falco peregrinus, Alisterus scapularis, Ninox strenua, Scythrops novaehollandiae, Menura novaehollandiae.* These, with the exception of *Ninox strenua* and *Menura novaehollandiae* may not breed in the Sanctuary, however they all use the area as feeding ground.

Several species of reptiles and amphibians, most notably the rare and endangered *Varanus rosenbergi* were also sighted. However, the herpetofauna of Katandra is rather impoverished, mainly due to the Sanctuary's small size and to a succession of bushfires through recent decades. It is possible, that there are quite a few more species of reptiles and amphibians in the area then it is implied by this report as our research of this segment of the fauna was often incidental or opportunistic (e. g. it was carried out in conjunction with mammal, bird and invertebrate field-work).

Representatives of most Australian insect orders can be found in the Sanctuary. A separate article will deal with the invertebrate fauna of Katandra.

Although some introduced pest species frequent this area, the presence of native elements emphasises the importance of this protected area. The most immediate danger threatening most of the vertebrate fauna of Katandra is the presence of feral mammals either by direct predation or by competition. A proposal for a perennial trapping program was proposed to Katandra Bushland Sanctuary Trust (Hangay 2000).

Another endangering factor is the ever-increasing urbanization of the area. At present the Sanctuary is mostly surrounded by vacant land, either privately or government owned. The vegetation of these lands are somewhat similar to Katandra, even if these areas are not properly cared for by any organization or government office. Birds and some mammals are regularly using these lands as feeding grounds, some even for breeding. These areas — although they no longer form large, uninterrupted bushlands — can also serve as corridors for migratory or nomadic species. Therefore it is of paramount importance, that these areas remain uninhabited by humans. Ultimately, their protection and conservation should also be implemented by possible annexation or formation of a national park or wildlife refuge. A recommendation regarding this matter was also put to Katandra Bushland Sanctuary Trust (Hangay 2000).

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